



JAPANESE
INDUSTRIAL
STANDARD

Translated and Published by
Japanese Standards Association

JIS B 2309 : 2009

(JSSA/JSA)

**Butt-welding pipe fittings for light
gauge stainless steel tubes for
ordinary use**

ICS 23.040.40

Reference number : JIS B 2309 : 2009 (E)

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B 2309 : 2009

Date of Establishment: 2009-03-20

Date of Public Notice in Official Gazette: 2009-03-23

Investigated by: Japanese Industrial Standards Committee
Standards Board

Technical Committee on Machine Elements

JIS B 2309:2009, First English edition published in 2009-09

Translated and published by: Japanese Standards Association
4-1-24, Akasaka, Minato-ku, Tokyo, 107-8440 JAPAN

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Printed in Japan

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Foreword

This translation has been made based on the original Japanese Industrial Standard established by the Minister of Economy, Trade and Industry through deliberations at the Japanese Industrial Standards Committee according to the proposal for establishing a Japanese Industrial Standard from Japan Stainless Steel Association (JSSA)/ Japanese Standards Association (JSA) with a draft of Industrial Standard based on the provision of Article 12 Clause 1 of the Industrial Standardization Law.

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Butt-welding pipe fittings for light gauge stainless steel tubes for ordinary use

1 Scope

This Standard specifies butt-welding pipe fittings made of stainless steel used for light gauge stainless steel tubes for ordinary piping specified in **JIS G 3448**.

Further, pipe fittings of special shape are specified in Annex A and the shapes and dimensions of bevel end are in Annex B. And the shapes and dimensions of loose-fit type flange are described in Annex C as a reference.

NOTE : The weld-fitting efficiency of pipe fitting shall be considered according to the piping design conditions such as temperature, pressure and so on.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this Standard. The most recent editions of the standards (including amendments) indicated below shall be applied.

- JIS B 0151 *Iron and steel pipe fittings—Vocabulary*
- JIS B 0601 *Geometrical Product Specifications (GPS)—Surface texture: Profile method—Terms, definitions and surface texture parameters*
- JIS G 0415 *Steel and steel products—Inspection documents*
- JIS G 3448 *Light gauge stainless steel tubes for ordinary piping*
- JIS G 3459 *Stainless steel pipes*
- JIS G 4303 *Stainless steel bars*
- JIS G 4304 *Hot-rolled stainless steel plates, sheet and strip*
- JIS G 4305 *Cold-rolled stainless steel plate, sheet and strip*
- JIS S 3200-1 *Equipment for water supply service—Test methods of hydrostatic pressure*
- JIS S 3200-7 *Equipment for water supply service—Test methods of effect to water quality*
- JIS Z 2201 *Test pieces for tensile test for metallic materials*
- JIS Z 2241 *Method of tensile test for metallic materials*
- JIS Z 3040 *Method of qualification test for welding procedure*
- JIS Z 3106 *Methods of radiographic examination for welded joints in stainless steel*
- JIS Z 3121 *Methods of tensile test for butt welded joints*
- JIS Z 3821 *Standard qualification procedure for welding technique of stainless steel*

3 Terms and definitions

For the purposes of this Standard, the terms and definitions given in **JIS B 0151** shall apply.

4 Classification

The classifications of pipe fittings shall be classified as follows according to the shapes and materials.

- a) The classification by shapes and its symbols shall be as shown in table 1.

Table 1 Classification by shapes and its symbols

Classification by shape		Symbol ^{a)}
Type	Sub-class	
45° elbow	Long	45E (L)
90° elbow	Long Short	90E (L) 90E (S)
Reducer	Concentric Eccentric	R (C) R (E)
Tee	Straight Reducing	T (S) T (R)
Stub end	Nominal pressure 5 K ^{b)} Nominal pressure 10 K ^{b)} Nominal pressure 20 K ^{b)}	SE (5 K) SE (10 K) SE (20 K)
Cap	—	C
Notes ^{a)} The parenthetic letters may be omitted. ^{b)} The pressure of 0.5 MPa max. applies to nominal pressure 5 K, 1.0 MPa max. to nominal pressure 10 K and 2.0 MPa max. to nominal pressure 20 K.		

- b) Symbol of classification by materials shall be as shown in table 2. Steel pipes corresponding to them are shown in table 2 as a reference.

Table 2 Symbol of classification by materials and corresponding steel pipes

Symbol of classification by materials	Corresponding steel pipes (informative)
SUS304WD	SUS304TPD of JIS G 3448
SUS315J1WD	SUS315J1TPD of JIS G 3448
SUS315J2WD	SUS315J2TPD of JIS G 3448
SUS316WD	SUS316TPD of JIS G 3448

- c) Pipe fittings shall be produced from the materials in table 3 by plastic forming, machine forming or welding of longitudinal seam, and solution heat treatment of 1 010 °C or over.

5 Materials

The materials of pipe fittings shall be the materials as shown in table 3 or the equivalent materials to them.

The equivalent materials shall be as follows according to the shapes of materials.

- a) Chemical composition shall conform to the materials specified in table 3 by cast analysis.
- b) The mechanical properties shall conform to the materials specified in table 3.
- c) In the case of welded steel pipe, air-pressure test, hydrostatic test or non-destructive test by the specification of Japanese Industrial Standard relevant to the steel pipe specified in table 3 shall be satisfied.

Table 3 Materials of pipe fittings

Symbol of material classification	Material		
	Steel pipe	Steel plate or steel strip	Steel bar
SUS304WD	SUS304TPD of JIS G 3448 SUS304TP of JIS G 3459	SUS304 of JIS G 4304 SUS304 of JIS G 4305	SUS304 of JIS G 4303
SUS315J1WD	SUS315J1TPD of JIS G 3448 SUS315J1TP of JIS G 3459	SUS315J1 of JIS G 4304 SUS315J1 of JIS G 4305	—
SUS315J2WD	SUS315J2TPD of JIS G 3448 SUS315J2TP of JIS G 3459	SUS315J2 of JIS G 4304 SUS315J2 of JIS G 4305	—
SUS316WD	SUS316TPD of JIS G 3448 SUS316TP of JIS G 3459	SUS316 of JIS G 4304 SUS316 of JIS G 4305	SUS316 of JIS G 4303

6 Chemical composition

The chemical composition of pipe fittings shall be in accordance with the specification of Japanese Industrial Standard relevant to materials specified in table 3 when tested in accordance with clause 14.

7 Mechanical properties

The mechanical properties of pipe fittings shall be in accordance with the followings when tested in accordance with clause 14.

- a) Tensile strength and elongation of pipe fittings shall be in accordance with the specification of Japanese Industrial Standard relevant to materials specified in table 3.
- b) Tensile strength of welding part of pipe fittings shall be in accordance with the specification of Japanese Industrial Standard relevant to steel pipes specified in table 2.

8 Pressure resistance properties

Pipe fittings shall resist to the test hydrostatic pressure specified in clause 14 and shall not leak.

9 Leaching properties

The leaching properties of pipe fittings shall be in accordance with table 4 when tested by clause 14.

NOTE : In Water Supply Law, the leaching test is specified for the pipe fittings used as feed-water equipment.

Table 4 Leaching properties

Items	Specification value
Taste	Not abnormal
Odour	Not abnormal
Chromaticity	5 degrees or under
Turbidity	2 degrees or under
Hexavalent chromium compounds	0.05 mg/L or under for the quantity of hexavalent chromium
Iron and its compounds	0.3 mg/L or under for the quantity of iron

10 Shapes and dimensions

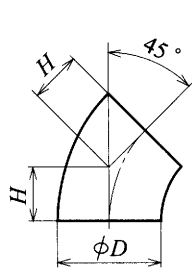
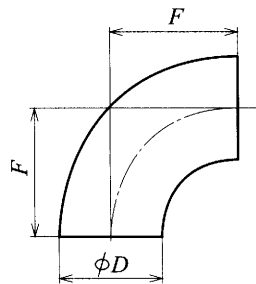
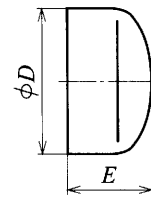
The shapes and dimensions of pipe fittings shall be as follows when tested in accordance with clause 14.

- The outside diameter and thickness of pipe fittings shall be in accordance with table 5.
- The shapes and dimensions of pipe fittings shall be in accordance with table 6 to table 10.
- The tolerance value of off angle and off plane shall be in accordance with table 11.

Table 5 Outside diameter and thickness of whole pipe fittings

Unit: mm

Designation Su	Outside diameter ϕD		Thickness t		
	Standard size	Tolerance on end face	Standard size	Tolerance on end face	Tolerance on other than end face
20	22.22	± 0.30	1.0	+0.3	+ not specified
25	28.58		1.0	-0.12	-0.2
30	34.0	± 0.34	1.2	+0.36 -0.12	+ not specified -0.24
40	42.7	± 0.43	1.2		
50	48.6	± 0.49	1.2		
60	60.5	± 0.60	1.5	+0.45 -0.15	+ not specified -0.3
75	76.3	± 0.76	1.5		
80	89.1	± 0.89	2.0	+0.5 -0.3	+ not specified -0.4
100	114.3	± 1.14	2.0		
125	139.8	± 1.40	2.0		
150	165.2	± 1.65	3.0	+0.5 -0.4	+ not specified -0.45
200	216.3	± 2.16	3.0		
250	267.4	± 2.67	3.0		
300	318.5	± 3.18	3.0		

Table 6 Shapes and dimensions of 45° elbows, 90° elbows and caps**45° elbow****90° elbow****Cap**

Unit: mm

Designation Su	Outside diameter ϕD		Distance from centre to end face			Tolerance	Distance from back to end face	
			45° elbow H	90° elbow F			Cap ^{b)} E	
				Long	Long			
	Standard size	Tolerance on end face	Standard size	Standard size	Standard size		Standard size	Standard size
20	22.22	±0.30	15.8	38.1	(28.6) ^{a)}	±0.8	12.0	±3.2
25	28.58		15.8	38.1	(28.6) ^{a)}		13.0	
30	34.0	±0.34	15.8	38.1	25.4		38.1	
40	42.7	±0.43	19.7	47.6	31.8		38.1	
50	48.6	±0.49	23.7	57.2	38.1		38.1	
60	60.5	±0.60	31.6	76.2	50.8		38.1	
75	76.3	±0.76	39.5	95.3	63.5		38.1	
80	89.1	±0.89	47.3	114.3	76.2		50.8	
100	114.3	±1.14	63.1	152.4	101.6		63.5	
125	139.8	±1.40	78.9	190.5	127.0		76.2	±6.4
150	165.2	±1.65	94.7	228.6	152.4		88.9	
200	216.3	±2.16	126.3	304.8	203.2	101.6		
250	267.4	±2.67	157.8	381.0	254.0	127.0		
300	318.5	±3.18	189.4	457.2	304.8	152.4		

Notes ^{a)} The value in parentheses is the dimension of necked type (see Annex A).^{b)} The shape of cap shall be semiellipse (the ratio of long diameter and short diameter at the inner surface shall be over 1 and 2 or under).